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[54] **OPTICAL AUXILIARY INPUT ARRANGEMENT AND METHOD OF USING SAME**

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Related U.S. Application Data

[63] Continuation of Ser. No. 829,916, Feb. 3, 1992, abandoned, which is a continuation-in-part of Ser. No. 829,880, Feb. 3, 1992, abandoned, and a continuation-in-part of Ser. No. 656,803, Feb. 14, 1991, abandoned, which is a continuation-in-part of Ser. No. 611,416, Nov. 9, 1999, Pat. No. 5,181, 015, which is a continuation-in-part of Ser. No. 433,029, Nov. 7, 1989, abandoned.

[51] **Int. Cl.**[6] **G09G 5/08**

[52] **U.S. Cl.** **345/158**; 345/157; 345/163

[58] **Field of Search** 345/163, 158, 345/157, 156, 164, 165, 167, 169, 180, 181; 353/42, 122, 30, 28; 348/734, 744; 356/375

[56] **References Cited**

U.S. PATENT DOCUMENTS

3,885,096	5/1975	Inuiya	345/180
4,280,135	7/1981	Schlossberg	348/61
4,565,999	1/1986	King et al.	345/158
4,745,402	5/1988	Auerbach	345/158
4,808,980	2/1989	Drumm	345/162
5,115,230	5/1992	Smoot	345/157
5,138,304	8/1992	Bronson	345/180

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[57] **ABSTRACT**

The optical auxiliary input arrangement for an optical system projecting computer generated images includes an image processing unit and communication interface for detecting the speed at which two high intensity auxiliary light images flash onto the projected computer image, to interpret the images as a mouse double click feature. The optical auxiliary input arrangement accurately and reliably discriminates between user generated double click information without the need of the user being so steady of hand as to cause the auxiliary light information beam to illuminate the same precise location on the viewing surface during the double click operation. The image processing unit and communication interface cooperate together to permit both a low speed mouse and the high speed light generating device to communicate with the system.

21 Claims, 9 Drawing Sheets